

REMARKS

Applicants respectfully request further examination and reconsideration in view of the above amendments. Claims 1-22 remain pending in the case. Claims 1, 2, 4-11 and 13-21 are rejected. Claims 3, 12 and 22 are objected to. Claims 1, 11 and 19 are amended herein. No new matter has been added.

ALLOWABLE SUBJECT MATTER

Applicants thank Examiner for indicating that Claims 3, 12 and 22 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

NOTICE OF REFERENCES CITED

Applicants respectfully note that the rejection of Claims 6 and 14, as discussed in the Detailed Action, is based in part on U.S. Patent No. 4,656,947, incorrectly identified by the Examiner as the Minn reference. However, the Notice of References Cited correctly identifies U.S. Patent No. 4,656,947 as the Gordon reference. As described below in the remarks discussing the rejection of Claims 6 and 14, the Gordon reference, entitled "Rifle Launched Ammunition for Mob Dispersion," appears to be non-analogous art. Applicants respectfully submit that in the event that if the Examiner finds the arguments accompanying the rejection of Claims 6 and 14 persuasive, that the Office Action following the instant Office Action should be a Non-Final Office Action.

SPECIFICATION

Applicants have amended the specification at page 17, line 20, to correct a typographical error. No new matter has been added. Specifically, the first instance of the term "Y-axis" has been corrected to recite the term "X-axis".

35 U.S.C. §102(b)

Claims 1, 2, 11, 19 and 20 stand rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 5,086,197 by Liou, hereinafter referred to as the "Liou" reference. Applicants have reviewed the cited reference and respectfully submit that the embodiments of the present invention as recited in Claims 1, 2, 11, 19 and 20 are not anticipated by Liou in view of the following rationale.

Applicants respectfully direct the Examiner to independent Claim 1 that recites that an embodiment of the present invention is directed to (emphasis added):

An apparatus for optical navigation comprising:
a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture;
an optical motion detection circuit integral to said apparatus and optically coupled to said detectable texture of said illuminated surface, said optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis, wherein said optical motion detection circuit is operable to detect said detectable texture without requiring an integral illumination source.

Independent Claims 11 and 19 recite similar limitations. Claim 2 that depends from independent Claim 1 and Claim 20 that depends from independent Claim 19 provide further recitations of the features of the present invention.

According to the Federal Circuit, "[a]nticipation requires the disclosure in a single prior art reference of each claim under consideration" (*W.L. Gore & Assocs. v. Garlock Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983); see also MPEP 2131).

However, it is not sufficient that the reference recite all the claimed elements. As stated by the Federal Circuit, the prior art reference must disclose each element of the claimed invention “arranged as in the claim” (emphasis added; *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984); see also *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990); see also MPEP 2131). In other words “[t]he identical invention must be shown in as complete detail as is contained in the ...claim” (emphasis added; *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); see also MPEP 2131).

Liou and the claimed invention are very different. Applicants understand Liou to teach an optical encoding device including multiple photo sensor arrays. In particular, Applicants understand Liou to teach that each photo sensor array is aligned in an axial direction, and that two photo arrays aligned in the same axial direction are required to work in combination to detect motion in the particular axial direction. Moreover, Applicants do not understand Liou to teach that the grid pad has a detectable texture.

With reference to Figure 1 of Liou, a device including four Photo Sensor Arrays 14, 14', 16 and 16' is shown (col. 3, lines 10-14). As described in Figure 5, Photo Sensor Arrays 16 and 16' are used for determining horizontal displacement (X-axis) of the device (col. 3, lines 41-51). Moreover, as described in Figure 6, Photo Sensor Arrays 14, 14', 16 and 16' are used for determining X-axial and Y-axial displacement (col. 4, lines 3-9). Accordingly, Applicants respectfully assert that Liou does not teach, describe or suggest “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated

surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added).

Furthermore, with reference to Figures 3 and 4 of Liou, Grid Pad 11 including coordinates lines is shown. The Examiner asserts that the grid lines are a detectable texture. However, Applicants have reviewed the Liou reference, and are unable to locate any teaching that Grid Pad 11 has a detectable texture. Therefore, Applicants respectfully assert that Liou does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Therefore, Applicants respectfully assert that nowhere does Liou teach, disclose or suggest the claimed embodiments of the present invention as recited in independent Claims 1, 11 and 19, that these claims overcome the rejection under 35 U.S.C. § 102(b), and are thus in a condition for allowance. Applicants respectfully submit that Liou also does not teach or suggest the additional claimed features of the present invention as recited in Claim 2 that depends from independent Claim 1 and Claim 19 that depends from independent Claim 20. Therefore, Applicants respectfully submit that Claims 2 and 20 also overcome the rejection under 35 U.S.C. § 102(b), and are in a condition for allowance as being dependent on allowable base claims.

35 U.S.C. §103(a)

Claim 4 and 21

Claims 4 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liou in view of United States Patent 6,963,059 by Lauffenburger et al., hereinafter

referred to as the “Lauffenburger” reference. Claim 4 depends from independent Claim 1 and Claim 21 depends from independent Claim 19. Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 4 and 21 are patentable over Liou in view of Lauffenburger for the following rationale.

As described above, Liou and the claimed invention are very different. Applicants understand Liou to teach an optical encoding device including multiple photo sensor arrays. In particular, Applicants understand Liou to teach that each photo sensor array is aligned in on axial direction, and that two photo arrays aligned in the same axial direction are required to work in combination to detect motion in the particular axial direction. Moreover, Applicants do not understand Liou to teach that the grid pad has a detectable texture.

Applicants respectfully assert that Liou teaches the use of multiple photo sensor arrays, where each photo sensor array is only operable to detect motion in one axial direction. By teaching that multiple photo sensor arrays are required for detecting X-axial and Y-axial displacement, Applicants respectfully assert that Liou teaches away from an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added).

Furthermore, Applicants have reviewed the Liou reference, and are unable to locate any teaching that Grid Pad 11 has a detectable texture. Therefore, Applicants respectfully assert that Liou does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Moreover, the combination of Liou and Lauffenburger fails to teach or suggest this claim limitation because Lauffenburger does not overcome the shortcomings of Liou. Applicants understand Lauffenburger to teach a method and system for optimizing illumination power and integration time in an optical sensing device. In particular, Applicants respectfully assert that Lauffenburger does not teach, describe, or suggest an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed. Furthermore, Applicants respectfully assert that Lauffenburger does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed.

Applicants respectfully assert that nowhere does the combination of Liou in view of Lauffenburger teach, disclose or suggest the present invention as recited in independent Claims 1 and 19, that these claims overcome the rejection under 35 U.S.C. § 103(a), and are thus in condition for allowance. Applicants respectfully submit the combination of Liou in view Lauffenburger also does not teach or suggest the

additional claimed features of the embodiments of the present invention as recited in Claim 4 that depends on independent Claim 1 and Claim 21 that depends on independent Claim 19. Therefore, Applicants respectfully submit that Claims 4 and 21 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

Claims 5, 8, 13 and 16

Claims 5, 8, 13 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liou in view of United States Patent 6,377,249 by Mumford, hereinafter referred to as the "Mumford" reference. Claims 5 and 8 depend from independent Claim 1 and Claims 13 and 16 depend from independent Claim 11. Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 5, 8, 13 and 16 are patentable over Liou in view of Mumford for the following rationale.

As described above, Liou and the claimed invention are very different. Furthermore, by teaching that multiple photo sensor arrays are required for detecting X-axial and Y-axial displacement, Applicants respectfully assert that Liou teaches away from an "optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis," as claimed (emphasis added). Moreover, as describe above, Applicants respectfully assert that Liou does not teach, describe or suggest "a surface comprising an aperture, said

surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Furthermore, the combination of Liou and Mumford fails to teach or suggest this claim limitation because Mumford does not overcome the shortcomings of Liou. Applicants understand Mumford to teach an electric light pen system. In particular, with reference to Figure 1 of Mumford, an electric light pen system including three photo sensitive detectors 23r, 23g and 23b is shown. Therefore, Applicants respectfully assert that Mumford does not teach, describe, or suggest an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added). Furthermore, Applicants respectfully assert that Mumford does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed.

Applicants respectfully assert that nowhere does the combination of Liou in view of Mumford teach, disclose or suggest the present invention as recited in independent Claims 1 and 11, that these claims overcome the rejection under 35 U.S.C. § 103(a), and are thus in condition for allowance. Applicants respectfully submit the combination of Liou in view Mumford also does not teach or suggest the additional claimed features of the embodiments of the present invention as recited in Claims 5 and 8 that depend from independent Claim 1 and Claims 13 and 16 that depend from independent Claim

11. Therefore, Applicants respectfully submit that Claims 5, 8, 13 and 16 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

Claims 6 and 14

Claims 6 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liou in view of United States Patent 4,656,947 by Gordon, hereinafter referred to as the “Gordon” reference. Claim 6 depends from independent Claim 1 and Claim 14 depends from independent Claim 11. Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 6 and 14 are patentable over Liou in view of Gordon for the following rationale.

Applicants respectfully note that the instant Detailed Action incorrectly identifies United States Patent 4,656,947 as the Minn reference. However, the Notice of References Cited correctly identifies U.S. Patent No. 4,656,947 as the Gordon reference.

As described above, Liou and the claimed invention are very different. Furthermore, by teaching that multiple photo sensor arrays are required for detecting X-axial and Y-axial displacement, Applicants respectfully assert that Liou teaches away from an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a

change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added). Moreover, as describe above, Applicants respectfully assert that Liou does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Furthermore, the combination of Liou and Gordon fails to teach or suggest this claim limitation because Gordon does not overcome the shortcomings of Liou. Applicants understand Gordon to teach a rifle launched ammunition for mob dispersion. Accordingly, Applicants respectfully assert that Gordon does not teach, describe, or suggest an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed. Furthermore, Applicants respectfully assert that Gordon does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed.

Moreover, Applicants respectfully note that Liou does not teach an apparatus wherein said illuminated surface is a cathode ray tube and wherein said detectable texture is a shadow mask of said cathode ray tube, as indicated by the Examiner in the instant Detailed Action (page 8, section 6). The Examiner relies on Gordon for providing such a teaching. Applicants understand Gordon to teach a rifle launched ammunition for mob dispersion. In particular, Applicants respectfully assert that Gordon

does not teach “wherein said illuminated surface is a cathode ray tube and wherein said detectable texture is a shadow mask of said cathode ray tube,” as claimed. Applicants respectfully submit that Gordon is silent as to such a teaching. Moreover, Applicants respectfully submit that Gordon is directed towards non-analogous art.

Applicants respectfully assert that nowhere does the combination of Liou in view of Gordon teach, disclose or suggest the present invention as recited in independent Claims 1 and 11, that these claims overcome the rejection under 35 U.S.C. § 103(a), and are thus in condition for allowance. Applicants respectfully submit the combination of Liou in view of Gordon also does not teach or suggest the additional claimed features of the embodiments of the present invention as recited in Claim 6 that depends from independent Claim 1 and Claim 14 that depends from independent Claim 11. Therefore, Applicants respectfully submit that Claims 6 and 14 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

Claims 7 and 15

Claims 7 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liou in view of United States Patent 5,771,039 by Ditzik, hereinafter referred to as the “Ditzik” reference. Claim 7 depends from independent Claim 1 and Claim 15 depends from independent Claim 11. Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 7 and 15 are patentable over Liou in view of Ditzik for the following rationale.

As described above, Liou and the claimed invention are very different. Furthermore, by teaching that multiple photo sensor arrays are required for detecting X-axial and Y-axial displacement, Applicants respectfully assert that Liou teaches away

from an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added). Moreover, as describe above, Applicants respectfully assert that Liou does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Furthermore, the combination of Liou and Ditzik fails to teach or suggest this claim limitation because Ditzik does not overcome the shortcomings of Liou. Applicants understand Ditzik to teach direct view display device integration techniques. Accordingly, Applicants respectfully assert that Ditzik does not teach, describe, or suggest an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed. Furthermore, Applicants respectfully assert that Ditzik does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed.

Applicants respectfully assert that nowhere does the combination of Liou in view of Ditzik teach, disclose or suggest the present invention as recited in independent Claims 1 and 11, that these claims overcome the rejection under 35 U.S.C. § 103(a), and are thus in condition for allowance. Applicants respectfully submit the combination of Liou in view Ditzik also does not teach or suggest the additional claimed features of the embodiments of the present invention as recited in Claim 7 that depends from independent Claim 1 and Claim 15 that depends from independent Claim 11. Therefore, Applicants respectfully submit that Claims 7 and 15 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

Claims 9, 10, 17 and 18

Claims 9, 10, 17 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Liou in view of United States Patent 5,442,147 by Burns et al., hereinafter referred to as the "Burns" reference. Claims 9 and 10 depend from independent Claim 1 and Claims 17 and 18 depend from independent Claim 11. Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 9, 10, 17 and 18 are patentable over Liou in view of Burns for the following rationale.

As described above, Liou and the claimed invention are very different. Furthermore, by teaching that multiple photo sensor arrays are required for detecting X-axial and Y-axial displacement, Applicants respectfully assert that Liou teaches away from an "optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein

said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed (emphasis added). Moreover, as describe above, Applicants respectfully assert that Liou does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed (emphasis added).

Furthermore, the combination of Liou and Burns fails to teach or suggest this claim limitation because Burns does not overcome the shortcomings of Liou. Applicants understand Burns to teach a position sensing apparatus. Applicants respectfully assert that Burns does not teach, describe, or suggest an “optical motion detection circuit comprising a single detector for acquiring images of said surface at a specified rate, said detector acquiring a single image at a time, and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis,” as claimed. Furthermore, Applicants respectfully assert that Burns does not teach, describe or suggest “a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture,” as claimed.

Applicants respectfully assert that nowhere does the combination of Liou in view of Burns teach, disclose or suggest the present invention as recited in independent Claims 1 and 11, that these claims overcome the rejection under 35 U.S.C. § 103(a), and are thus in condition for allowance. Applicants respectfully submit the combination of Liou in view Burns also does not teach or suggest the additional claimed features of

the embodiments of the present invention as recited in Claims 9 and 10 that depend from independent Claim 1 and Claims 17 and 18 that depend from independent Claim 11. Therefore, Applicants respectfully submit that Claims 9, 10, 17 and 18 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

CONCLUSION

In light of the above remarks, Applicants respectfully request reconsideration of the rejected claims. Based on the arguments presented above, Applicants respectfully assert that Claims 1, 2, 4-11 and 13-21 overcome the rejections of record and, therefore, Applicants respectfully solicit allowance of these Claims. The Examiner is invited to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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